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| APPLICATION NO.        | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|------------------------|-------------|----------------------|---------------------|------------------|
| 10/500,271             | 06/25/2004  | Naokazu Murase       | 2001JP503           | 9820             |
| 40256                  | 7590        | 08/17/2006           | EXAMINER            |                  |
| FERRELLS, PLLC         |             |                      | BERNSHTEYN, MICHAEL |                  |
| P. O. BOX 312          |             |                      | ART UNIT            | PAPER NUMBER     |
| CLIFTON, VA 20124-1706 |             |                      | 1713                |                  |

DATE MAILED: 08/17/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/500,271

Applicant(s)

MURASE ET AL.

Examiner

Michael Bernshteyn

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 02/16/05, 07/12/05
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_

## DETAILED ACTION

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein

were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

1. Claims 1-7, 10-11 and 14-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Murase (WO 00/23533) in view of Yoshihara (U. S. Patent 5,719,205). The patent U. S. Patent 6,517,941 is equivalent to the WO 00/23533 therefore the following rejection is based upon the U. S. Patent 6,517,941.

Murase discloses a coating composition with which it is possible to make coated paper that is excellent in various properties such as glossiness, water resistance, solvent resistance, heat resistance, thermal blocking resistance and ink penetration and that can readily be recycled (abstract).

With regard to the limitations of claims 1, 3, 4, 6, 11, 16 and 17, Murase discloses a coating composition comprising a hydrosol emulsion and **colloidal silica**, wherein the hydrosol emulsion is obtained by neutralizing, with an alkali, a **synthetic resin emulsion** prepared by dispersing, in water, particles of a synthetic resin having carboxyl group and an alkoxysilyl group (abstract).

The synthetic resin emulsion can be prepared by subjecting, at least, a (meth)acrylic alkyl ester, an ethylenically unsaturated carboxylic acid, and an organoalkoxysilane having radically polymerizable unsaturated bond to emulsion polymerization (col. 2, lines 32-36). Examples of such (meth)acrylic alkyl esters include

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methyl acrylate, ethyl acrylate, propyl acrylate, butyl acrylate, 2-ethylhexyl acrylate, **cyclohexyl methacrylate** and **cyclohexyl acrylate**. These alkyl esters can be used either singly or in combination of two or more members (col. 3, lines 7-15). Additionally the coating composition can further comprise monomers copolymerizable with the above described (meth)acrylic alkyl esters, such as vinyl chloride, vinylidene chloride, **styrene** and **methyl styrene**, vinyl esters such as vinyl acetate, vinyl propionate, etc. These monomers can be used either singly or in combination of two or more members. Of these, **styrene** is preferred as a comonomer from the viewpoints of water resistance and glossiness (col. 5, lines 3-30, Examples 1-5 with styrene, Examples 6 with cyclohexyl methacrylate).

This group of monomers can be exemplified as monomers (D) of claim 1, and cyclohexyl methacrylate, cyclohexyl acrylate, styrene and methyl styrene can be exemplified as monomers (C) of claim 1.

Murase discloses that the organoalkoxysilane is preferably a compound having radically polymerizable unsaturated bond, which include vinylorganoalkoxysilanes such as vinyltrimethoxy-silane, vinylmethyldimethoxysilane, vinyldimethylmethoxysilane, vinyltrimethoxysilane, vinyl(2-methoxyethoxy)silane and vinyltriacetoxysilane; etc. These compounds can be used either singly or in combination of two or more members. Of these, **3-methacryloxypropyl-triethoxysilane** is preferred in the present invention from the viewpoint of polymerizability (col. 4, lines 10-37).

This group of monomers can be exemplified as monomers (B) of claim 1.

Murase discloses that surfactants that can be used as optional components are those ones that can act as emulsifiers in emulsion polymerization. Specific examples of such surfactants include conventional anionic or nonionic surfactants. To impart increased water resistance to the resultant coated paper, it is also possible to use, as the reactive-surfactants, those ones containing in their molecules one or more radically polymerizable unsaturated groups. These surfactants are used for the polymerization in the form of a mixture (col. 5, lines 54-64). As possible emulsifier, **sodium alkylallylsulfosuccinate** was used in all examples 1-8 (col. 7 line 65 through col. 10, Table 1). This emulsifier can be exemplified as emulsifier (A) of claim 1 (see the specification, Production Examples 1, 4, 6 and 8).

Murase also discloses preferred examples of cross-linkable monomers include monomers having two or more polymerizable unsaturated groups. Examples of such monomers having two or more polymerizable unsaturated groups include divinyl compounds, di(meth)acrylate compounds, tri(meth)acrylate compounds, tetra(meth)acrylate compounds, diallyl compounds, triallyl compounds and tetraallyl compounds. Preferred examples of these monomers specifically include divinylbenzene, divinyl adipate, ethylene glycol di(meth)acrylate, diethylene glycol di(meth)acrylate, triethylene glycol di(meth)acrylate, polyethylene glycol di(meth)acrylate, etc. These monomers can be used either singly or in combination of two or more members. Further, it is also possible to use these cross-linkable monomers in addition to the above-described copolymerizable monomers (col. 5, lines 30-53).

This group of monomers also can be exemplified as monomers (D) of claim 1.

The colloidal silica for use is preferably a colloidal sol of ultra fine silica particles dispersed in water. It is preferable that the particle diameters of primary particles in this sol are in the range of 5 to 20 nm and that the shape of the primary particles be globular, which is within the claimed range (col. 7, lines 2-6).

With regard to the limitations of claims 1, 5, 10, 14 and 15, Murase does not disclose that emulsion particles have a particle diameter of 100 nm or less.

Yoshihara discloses that the particle diameter of the synthetic resin particles in the coating, particularly when the formation of a transparent coating is contemplated, determines the optical properties of the coating. A proper particle diameter is selected preferably in a range of 10  $\mu\text{m}$  or less. The particle diameter is particularly preferably less than the wavelength of light 0.05-0.06  $\mu\text{m}$ , which is in a visible light region and to which human being is highly sensitive (col. 7, lines 4-9).

Both references are analogous art because they are from the same field of endeavor concerning new coating compositions.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to adjust the particle diameter of the synthetic resin particles in the claimed range as taught by Yoshihara in Murase's synthetic resin emulsion for coating composition because it does not adversely affect the light transmission from the viewpoint of the visual acuity of the human being and also because, when an inorganic component is grown within the synthetic resin particles, the inorganic component is not grown to an excessive size (US'205, col. 7, lines 4-13), and

thus to arrive at the subject matter of instant claim 1 and dependable claims 5, 10, 14 and 15.

With regard to the limitations of claim 2, Murase discloses that the amount of the surfactants to be used is preferably about 0.3 to 10% by weight, more preferably about 1.0 to 5.0% by weight of the total amount of the monomers used, which is within the claimed range (col. 5, lines 65-67). The amount of the organoalkoxysilane having radically polymerizable unsaturated bond to be used is preferably from 0.1 to 10 parts by weight, more preferably from 0.5 to 5 parts by weight for 100 parts by weight of the nonvolatile matter of the hydrosol emulsion, which is within the claimed range (col. 4, lines 38-42).

It is noted that the amount of the weight ratio of the components A, B and C is a result effective variable, and therefore, it is within the skill of those skilled in the art to find the optimum value of a result effective variable, as per *In re Boesch and Slaney* 205 USPQ 215 (CCPA 1980). See also *Peterson*, 315 F.3d at 1330, 65 USPQ2d at 1382: "The normal desire of scientists or artisans to improve upon what is already generally known provides the motivation to determine where in a disclosed set of percentage ranges is the optimum combination of percentages."

With regard to the limitations of claim 7, Murase discloses that the colloidal silica is used in an amount of preferably 10 to 200 parts by weight, more preferably 20 to 150 parts by weight for 100 parts by weight of the nonvolatile matter of the hydrosol emulsion, which is within the claimed range (col. 7, lines 16-19).



With regard to the limitations of claim 18, Murase discloses that coated recording medium that can be obtained by applying, to the surface of a substrate, the aforementioned coating composition (col. 7, lines 44-47).

2. Claims 12 and 13 are rejected under 35 U.S.C. 102(b) as being anticipated by Murase (WO00/232533).

With regard to the limitations of claims 12 and 13, Murase discloses that the coating composition can easily be produced by uniformly mixing, through the application of a conventional stirring means or the like, the hydrosol emulsion and colloidal silica in predetermined amounts. In the coating composition, the hydrosol emulsion containing carboxyl group and an alkoxysilyl group, excellent in various physical properties is combined with the colloidal silica. The coating composition therefore shows stable physical properties and excellent handling properties (col. 7, lines 33-43).

The coating composition may be applied to the surface of a substrate through the application of a conventional coating means or finishing operation properly selected. Any substrate material can be used for the substrate of the coated recording medium according to the present invention as long as a film can be formed on it by applying the coating composition of the invention. Examples of such substrate materials include paper, cloth, wood, metallic plates, and organic materials such as plastics. Paper is preferred as the substrate (col. 7, lines 48-58).

3. Claims 8, 9, and 19-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Murase in view of Yoshihara and further in view of Sumita et al. (EP 1 114 734 A1).

The combined disclosure of Murase and Yoshihara references resided in § 1 is incorporated herein by reference.

With regard to the limitations of claims 8, 9, and 19-20, the combined teaching of Murase and Yoshihara does not disclose a construction of an ink jet recording medium.

Sumita discloses an ink jet recording sheet, which comprises being constructed by a composition containing a (meth)acrylic based copolymer having a hydrolysable silyl group in which a polymerizable unsaturated monomer having a hydrolysable silyl group is copolymerized with monomers containing a (meth)acrylate-based polymerizable unsaturated monomer, and inorganic compound fine particles.

The recording sheet can be prepared by forming an image-receiving layer composed of the resin composition for recording at least one surface of the above-described material. Ink-absorbing layer can be prepared by coating a coating liquid, which is prepared using an appropriate solvent on a supporting material. Since the ink jet recording sheet obtained using the resin composition possesses an image-receiving layer, an ink absorbing ability and ink-fixing ability are high, and water resistance and printing quality are especially improved and, even though it is employed in a printing machine having a large printing speed, there can be obtained a clear and sharp image without beading. That is, a letter-printing portion or an image portion is formed by a water-based ink without causing inferiority in an image such as beading and roll mark-adhering owing to an ink jet recording method, and when a dried printing portion or a picture image portion is immersed in water. Further, in order to elevate a fixing ability of

a coloring agent (a dye), there is employed a dye-fixing agent, particularly, a polymeric dye-fixing agent, which has a cationic group in the molecule (page 44, [0042]-[0049]).

All references are analogous art because they are from the same field of endeavor concerning new resin coating compositions for ink jet recording medium.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to employ the combined Murase and Yoshihara's coating composition in Sumita's ink jet recording medium because this coating composition shows stable physical properties and excellent handling properties (US'941, col. 7, lines 40-42), and thus to arrive at the subject matter of instant claims 8, 9, 19 and 20.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael Bernshteyn whose telephone number is 571-272-2411. The examiner can normally be reached on M-F 8-5:30.


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Wu can be reached on 571-272-1114. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Michael Bernshteyn  
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